

Borehole

51-14-11

Log Event A

Borehole Information

| | | |
|-------------------------|---------------------------------|----------------------------------|
| Farm : <u>TX</u> | Tank : <u>TX-114</u> | Site Number : <u>299-W15-117</u> |
| N-Coord : <u>41,999</u> | W-Coord : <u>75,863</u> | TOC Elevation : <u>669.94</u> |
| Water Level, ft : | Date Drilled : <u>9/30/1970</u> | |

Casing Record

| | | |
|----------------------------|--------------------------------|--------------------|
| Type : <u>Steel-welded</u> | Thickness : <u>0.280</u> | ID, in. : <u>6</u> |
| Top Depth, ft. : <u>0</u> | Bottom Depth, ft. : <u>100</u> | |

Borehole Notes:

The driller's log does not mention any perforations or grouting of this borehole; therefore, it is assumed that the borehole was not perforated or grouted. The casing thickness is presumed to be 0.280 in., on the basis of published thickness for schedule-40, 6-in. steel tubing.

The driller's log indicates that the footing was struck when drilling. A different drilling rig was used to complete the borehole from 68 ft to the total depth.

Equipment Information

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|-----------------------------------|---|--|
| Logging System : <u>2</u> | Detector Type : <u>HPGe</u> | Detector Efficiency: <u>35.0 %</u> |
| Calibration Date : <u>10/1995</u> | Calibration Reference : <u>GJPO-HAN-3</u> | Logging Procedure : <u>P-GJPO-1783</u> |

Log Run Information

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|--------------------------------|---------------------------------|---------------------------------------|
| Log Run Number : <u>1</u> | Log Run Date : <u>2/8/1996</u> | Logging Engineer: <u>Gary Lekvold</u> |
| Start Depth, ft.: <u>0.0</u> | Counting Time, sec.: <u>100</u> | L/R : <u>L</u> Shield : <u>N</u> |
| Finish Depth, ft. : <u>5.5</u> | MSA Interval, ft. : <u>0.5</u> | Log Speed, ft/min.: <u>n/a</u> |

| | | |
|---------------------------------|---------------------------------|---------------------------------------|
| Log Run Number : <u>2</u> | Log Run Date : <u>2/9/1996</u> | Logging Engineer: <u>Gary Lekvold</u> |
| Start Depth, ft.: <u>99.5</u> | Counting Time, sec.: <u>100</u> | L/R : <u>L</u> Shield : <u>N</u> |
| Finish Depth, ft. : <u>12.5</u> | MSA Interval, ft. : <u>0.5</u> | Log Speed, ft/min.: <u>n/a</u> |

| | | |
|--------------------------------|---------------------------------|---------------------------------------|
| Log Run Number : <u>3</u> | Log Run Date : <u>2/12/1996</u> | Logging Engineer: <u>Gary Lekvold</u> |
| Start Depth, ft.: <u>13.5</u> | Counting Time, sec.: <u>100</u> | L/R : <u>L</u> Shield : <u>N</u> |
| Finish Depth, ft. : <u>4.5</u> | MSA Interval, ft. : <u>0.5</u> | Log Speed, ft/min.: <u>n/a</u> |

Borehole

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Analysis Information

Analyst : D.L. ParkerData Processing Reference : P-GJPO-1787Analysis Date : 1/2/1997**Analysis Notes :**

This borehole was logged in three log runs with two relog sections. For log runs one and two, the pre- and post-survey field verification spectra met the acceptance criteria established for the peak shape and detector efficiency. The energy calibration and peak-shape calibration from these spectra were used to establish the channel-to-energy parameters used in processing the spectra acquired during the logging operation. For log run three, the pre-survey verification spectra were lost and it is assumed that the spectra were accidentally written over in the field. The post-survey field verification spectra met the acceptance criteria established for the peak shape and detector efficiency and were used in the analysis of data from the third log run.

Casing correction factors for a 0.280-in.-thick steel casing were applied during analysis.

The only man-made radionuclide detected in this borehole was Cs-137. The presence of Cs-137 contamination was measured almost continuously from the ground surface to about 49 ft. Within this zone of general contamination five intervals of interest can be identified: from 0.5 to 11 ft, 15.5 to 22 ft, 44 to 46 ft, 90 to 91 ft, and 95.5 ft to the bottom of the borehole (99.5 ft).

The peak around 44 ft is distinct and the concentrations increase from 0.3 pCi/g at 42 ft and decrease to 0.3 pCi/g at 46 ft. The highest Cs-137 concentration in the interval from 0.5 to 11 ft is 40 pCi/g at 9 ft. The Cs-137 concentration in the zone from 15.5 to 22 ft reaches about 5 pCi/g. A distinct peak is seen at 90.5 ft with a maximum concentration of 1.0 pCi/g. Cs-137 contamination is also present at the bottom of the borehole. The maximum concentration in the interval between 95.5 ft and the bottom of the borehole is 6 pCi/g. The highest interval of Cs-137 contamination was detected between 44 and 46 ft. The maximum Cs-137 concentration was 53 pCi/g at 44 ft.

Measurable K-40 concentrations increase at about 47 ft. The U-238 and Th-232 concentrations increase between 96 ft and the bottom of the borehole.

Additional information and interpretations of log data are included in the main body of the Tank Summary Data Reports for tanks TX-114 and TX-117.

Log Plot Notes:

Separate log plots show the man-made (Cs-137) and the naturally occurring radionuclides (KUT). The natural radionuclides can be used for lithology interpretations. The headings of the plots identify the specific gamma rays used to calculate the concentrations.

Uncertainty bars on the plots show the statistical uncertainties for the measurements as 95-percent confidence intervals. Open circles on the plots give the MDL. The MDL of a radionuclide represents the lowest concentration at which positive identification of a gamma-ray peak is statistically defensible.

A combination plot includes the man-made and natural radionuclides, the total gamma derived from the spectral data, and the Tank Farms gross gamma log. The gross gamma plot displays the latest available digital data. No attempt has been made to adjust the depths of the gross gamma logs to coincide with the



Spectral Gamma-Ray Borehole
Log Data Report

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SGLS data.

A separate plot of representative historical gross gamma-ray logs selected at approximately 1 year intervals from May 1980 to June 1991 was created from historical gross gamma log data.